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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
BERTHEAUD, PETER JOHN	
ART UNIT	PAPER NUMBER
3746	

MAIL DATE	DELIVERY MODE
11/24/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/669,275	HARBUCK, E. SETH	
	Examiner	Art Unit	
	PETER J. BERTHEAUD	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5,10 and 13-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5,10 and 13-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 September 2010* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/17/2010 has been entered. It should be noted that claims 10 and 13 have been amended and claims 1-4, 6-9, 11-12 and 25-30 have been cancelled.

Drawings

2. The drawings submitted 9/17/2010 will not be entered because they introduce new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The newly submitted drawings are not supported by the original disclosure because they no longer show a piston assembly comprising a piston end cap, a machine ball, and a piston acting together as an inertial check valve, as stated in the specification and the claims. It fact, the figures do not seem to show a check valve associated with the piston at all.

Furthermore, while figures 4 and 5 seem to agree with part of the specification, it cannot be determined how the device would pump any fluid based on these figures. The specification does not go into enough detail as to explain how the pump shown in the

drawings pumps fluid. These issues are discussed in detail in the 35 U.S.C. 112, first paragraph rejections below.

Applicant is required to cancel the new matter in the reply to this Office Action.

3. It should also be noted that the drawings, if entered, would be objected to under 37 CFR 1.83(a) because they fail to show the piston assembly comprising a piston end cap, a machine ball, and a piston acting together as an inertial check valve. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 13.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 5, 10 and 13-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The claimed fuel pump is not enabled for the following reasons:

Claim 5 and the specification state that "the piston assembly comprises a piston end cap, a machine ball, and a piston acting together as an inertial check valve." The new drawings submitted 9/17/2010 show that piston 8 becomes disconnected from the piston end cap 7 when the coil is energized (see Figs. 4 and 5). If the piston end cap is part of the piston assembly, as stated in the claim, then why would it become separated from the piston? Furthermore, by the piston end cap 7 and piston 8 separating during pump strokes they are no longer "acting together as an inertial check valve." In fact, the current drawings don't seem to show any valve at all involving the piston, piston end cap and machine ball, and certainly not an "inertial check valve." When the piston moves

from left to right, the machine ball 17 merely moves in the space between the piston 8 and the piston end cap 7 and both ends of the piston bore are left open (as shown in figures 4 and 5). When the piston moves from right to left, under pressure from the spring, it is shown to press the machine ball 17 against the piston end cap 7, completely filling it, thereby not allowing any fluid to enter the piston bore (see Figs. 1 and 3). What part of that operation or structure constitutes valving? Simply put, there is no "inertial check valve" comprising the piston, piston end cap and machine ball shown in the drawings. Based on the specification alone one skilled in the art would not be able to make and/or use the invention, thus this claim is not enabled.

The piston end cap and piston assembly, as shown the drawings submitted 9/17/2010, will not allow any fluid to be pumped. In the previous Office action, the Examiner had expressed that the drawings submitted 1/25/2010 did not meet the disclosure in the specification stating, "when the coil assembly 21 of the fuel pump A is not energized, the reset spring 10 biases the piston 8 against the machine ball 17 and the piston end cap 7. The biased piston 8 presses against the machine ball 17 to seal the machine ball 17 against the piston end cap 7." Applicant's newly submitted drawings now meet this disclosure. However, by doing so, it would seem that the Applicant has completely overhauled his invention, again creating something that will clearly not pump any fluid. As described on page 8 of the originally filed specification, fluid would seem to enter the pump at element 45 and exit at element 25, meaning the piston 8 would have to move fluid from left to right (when looking at the figures) to push fluid through the check valve 22. However, as the piston moves from left to right the piston end cap 7

stays in place, disconnecting from the piston, this allows the machine ball 17 to move freely in space rather than sealing its back end (as shown in Figs. 4 and 5). A large gap between the ball and piston 8 is created which allows fluid to escape to the left side of the piston 8 upon rightward movement. When the piston reaches its furthermost right position and begins to move back left, the machine ball 17 will undoubtedly bounce between the piston end cap 7 and the piston 8 before it completely fills the space (as shown in Figs 1 and 3). If anything this movement will only push more fluid back towards the left side of the pump assembly rather than into the piston bore. There is no way that the structure shown in the drawings will be able to pump fluid through the check valve 22 (as stated in the last full paragraph on page 8 of the specification). If this pump were activated fluid would most likely slosh back and forth within the housing, perhaps only moving a small amount of fluid from right to left. The examiner is confused by the amendments to the drawings and discrepancies in the specification, and therefore maintains that the claim language is not enabled.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 5, 10, and 13-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "about" in claim 5, used in lines 7 and 8, is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one

of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The values in claim 5 are all preceded by the term about, and thus these ranges are not really defined. This gives the Examiner proper grounds for making a sufficiently broad interpretation of the claim.

Furthermore, claim 5 recites that the coil assembly generates a minimum flow rate of "20 pounds of fuel per hour." However, it is not specified what type of fuel is to be pumped, this is relevant because not all fuels weigh the same per unit volume. For example, regular gasoline typically weighs 6-6.5 pounds/gallon, whereas diesel fuel typically weighs 7-7.3 pounds/gallon. Therefore, if 20 pounds of gasoline is pumped it would be roughly 3.2 gallons, and 20 pounds of diesel fuel would be roughly 2.8 gallons. It is assumed that the pump moves the same volume of fluid per unit time regardless of what type is being pumped. Thus, the claim is indefinite because depending on the density of the fuel being pumped, 20 pounds of fuel per hour could be various volumetric amounts. A "flow rate" when referring to fluid is typically measured in terms of volume per unit time, not weight per unit time.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kofink 3,302,582 in view of Whitted 1,908,092, and in further view of Schechter 4,327,695.

Kofink (Fig. 1) discloses, regarding claim 5, a fuel pump for an internal combustion engine comprising: an enclosure (1, 3, 14); a piston assembly 5; and a coil assembly 4 capable of operating the piston assembly; wherein the enclosure comprises a housing 3, a first housing end cap 1, and a second housing end cap 14; and wherein the piston assembly 5 comprises a piston end cap (see the portion of the valve assembly 10 that holds spring 10b against ball 10a at the top of the piston), a machine ball 10a, and a piston acting together as an inertial check valve 10; a reset spring 9 and a check valve 2; and wherein the first housing end cap 1 is generally cylindrical shaped and includes an annular offset (see portion of 1 that presses a seal against portion 3d of the housing) to allow for connection to the housing 3, the annular offset acting as a shoulder to locate the housing 3 onto the first housing end cap 1. However, Kofink does not teach the following filter and microprocessor limitations taught by Whitted and Schechter, respectively.

Whitted teaches, further regarding claim 5, fuel pump assembly comprising: a fuel filter assembly including a filter cap 154, a filter spring 156, a filter 160, and an O ring 168, the filter having a filter end plate 158 whereby the filter is held in place by captivating the filter spring 156 between an interior of the filter cap 154 and the surface of the filter end plate 158.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the pump assembly of Kofink by implementing a filter

end plate, cap, and spring, as taught by Whitted, in order to filter the fuel being pumped and to maintain the filter's position even when there is a strong fluid flow.

Schechter teaches, further regarding claim 5, a fuel pump assembly comprising: a piston assembly 26, a coil assembly 22, and a microprocessor for operating the coil through a series of electrical impulses (see col. 3, line 61 – col. 4, line 19).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified the pump assembly of Kofink by implementing a microprocessor, as taught by Schechter, in order to more accurately control the electrical impulses to the coil, the stroke of the piston, and thus the flow of fluid from the pump.

Still further regarding claim 5, Kofink in view of Whitted and Schechter discloses the general conditions of the claimed invention including the coil assembly operating the piston assembly at a frequency of between about 30 Hz and about 50 Hz to generate a fuel pressure of between about 5 psig and about 15 psig at a minimum flow rate of about 20 pounds of fuel per hour. This is due to the fact that these values are all relative as they are preceded by the term “about”. Regardless of the actual values of the frequency, pressure, and flow rate of the above combination, they will meet the claim limitations under the broadest reasonable interpretation of the claim. Any value can be “about” another valve, it’s just a matter of relative interpretation. Therefore, Kofink in view of Whitted and Schechter teaches these claim limitations.

In the alternative, it would have been obvious to one having ordinary skill in the art at the time the invention was made to operate the coil assembly within these

parameters, since the claimed values are merely optimum or workable ranges. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller,* 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) see MPEP 2144.05 II - Optimization of Ranges).

Response to Arguments

11. Applicant's arguments with respect to claims 5, 10 and 13-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PETER J. BERTHEAUD whose telephone number is (571)272-3476. The examiner can normally be reached on M-F 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

PJB
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